USE OF SEVERITY ADJUSTED COMPARATIVE SYSTEMS IN THE DEVELOPMENT OF CRITICAL PATHWAYS

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This paper has been prepared to present how South Shore Hospital has successfully used computerized applications to provide the highest quality patient care in the most cost-efficient manner.

INTRODUCTION

Critical pathways are better accepted by physicians if they are based on "best practice" patterns in the institution in which they are being developed rather than solely on national standards. South Shore Hospital is focusing on improving patient care using the Iameter system to identify "best practice" patterns as a basis for developing critical pathways or Patient Outcome Plans (POPS)™©1994.[1]

CURRENT LITERATURE

It has been clearly documented that hospital admission and population mortality rates fluctuate greatly across and within geographical areas.[2] As organizations strive to improve the effectiveness and efficiency of patient care, a review of the literature reveals that critical pathways provide a strategic tool to standardize and improve patient care.[3,4,5] Critical Pathways allow providers a methodology to incorporate cost effective treatment, optimal patient care outcomes and patient satisfaction into a strategic plan of care. It is important to note that a critical path methodology does not always assure a reduction in length of stay or hospital charges.[6] Yet it provides an opportunity to strategically plan care in a collaborative, resource sensitive and patient focused manner.

DEVELOPMENT PROCESS

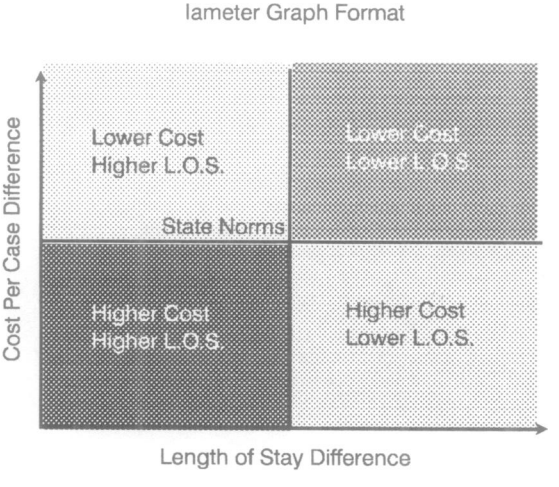
South Shore Hospital is a not-for-profit 325-bed community hospital with 350 active staff physicians serving 15 communities south of Boston, providing inpatient, ambulatory and visiting nurse services. The hospital has been awarded JCAHO accreditation with commendation on its last two triennial surveys.

For the past three years, we have used the Iameter[7] system to advise our medical staff of their variations in practice patterns in the top 20 DRGS by volume. Iameter is a severity adjusted system that compares length of stay and charges per physician, per DRG, against a state norm. Using data from physicians whose ordering patterns are most efficient from the point of view of shortest stay and lowest charges, we have developed POPS across services: Medical - Surgical (29), Cardiac (1), OB/GYN (5), Pediatric (5), and Orthopedic (2).

We have adapted Iameter into a software program that allows us to compare individual physician practice patterns for length of stay and use of resources. Using our three-year experience information, we have developed our POPS based on "best practice" patterns in our institution.

Practice patterns are presented in the form of a graph that shows how Iameter tracks cost effective care based on four quadrants in Figure 1.

Figure 1.



The practice pattern of a physician who has admitted three or more patients in a particular DRG within this time period are displayed on a scattergram. All patients are severity adjusted into five main categories on the basis of age, sex, and co-morbid conditions. Iameter determines the patient's position on the graph from the information provided.

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Physicians in the upper right quadrant have lower lengths of stay and lower charges which compared to the state norm and, therefore, more efficient use of resources. Those physicians in the left lower quadrant have longer lengths of stay and higher charges.

Iameter data is presented to all seven medical staff departments and each physician is presented with his data compared to his peers and the state norm. Multidisciplinary- teams analyze the data seeking systems changes that would contribute to improvement.

It should be understood that quality measurements are not part of these graphs other than the acceptance of the premise that quality care costs less and therefore cost efficient care relates directly to higher quality. Other quality measures are needed and thus Patient outcomes are carefully monitored through clinical screens designed to identify any variances as well as through the Maryland Indicator[8] project. This quality research project includes 10 inpatient indicators and five ambulatory care/emergency department indicators. Quarterly updates from Maryland Indicator alert us to any variances in outcomes compared to other institutions locally, regionally and nationally.

Patient satisfaction is monitored through the Press, Ganey[9] questionnaires for both inpatient and outpatient. Comparative information is provided quarterly identifying any variances in patient satisfaction for all hospital services.

Clinical Access Program

The Clinical Access Program (CAP)[10] is a data base developed to provide several custom reports of South Shore Hospital's patient and physician population. The information provided is extracted from the database received from Iameter over the past three years.

The program utilizes the Access™[11] database software to extract, report, and graph the following specific information: Provider, Physician, Department, Patient, DRG, Principal Diagnosis, AIM and Patient Accounting . This information is downloaded from our AR/ADT system and into the Iameter system . The Iameter system compares the hospital's data to the state norm database acquired from the state's rate setting commission. The Access™ database is then ready to take the Iameter data and individualize the reports for the user. The software is presented in a "user-friendly" windows environment.

A concern with using the Iameter data initially was that it only provided an annual retrospective analysis of data. This led us to recognize the differences in practice variances from one year to the next. Was it because of the shift from fee for service to capitation contracts, the payer demands to use observation status for defined diagnoses, or truly physician ordering practices? To answer some of these questions, we developed a data base to query and view the Iameter data from a global hospital perspective down to the individual patient level.

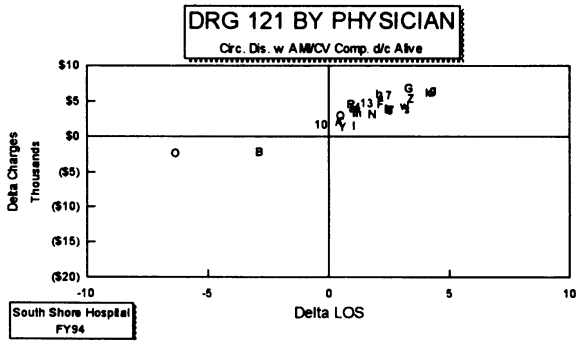
South Shore Hospital developed flexible views of the data, allowing intuitive analysis of variances by major diagnostic category (MDC), diagnostic related group (DRG), ICD-9-CM codes, physician, and patient severity. This provided the multidisciplinary teams with detailed data which highlights the opportunities for clinical practice improvement.

The CAP program provides clinical information in a "drill down" fashion. There are four (4) levels of inquiry. The user may begin by selecting reports for GLOBAL hospital clinical data sets. For example, the user may attain a listing of the top 20 DRGs for fiscal year 1994 by volume, charges, or length of stay (LOS). Also available are severity reports. The user may query the top 20 DRGs for AIM 1 (low severity level) or AIM 5 (high severity level) patients with this program. AIM 1 category relates to younger, female patients with no co-morbid conditions while AIM 5 relates to elderly, male patients with numerous co-morbid conditions. This information identifies low severity patients who could receive care in an ambulatory setting, thus reducing hospital resources.

At the DEPARTMENT level, the user may query reports regarding actual vs. expected outcomes for a clinical population. The outcomes available for reporting include DRG, charge per patient, LOS per patient, and mortality information. With this information, the user may examine those departments that may have fallen below the state expected norms. Also within this section of the program, the user may further examine which DRGs are creating the less than desired performance for the department.

The PHYSICIAN level allows the user is to examine the physician population and, therefore, patient practice patterns by the DRG of interest. As shown below in Figure 2, the program provides an overview of all the physicians practicing within a DRG. The diagram represents variances in charges and LOS as compared to the state norm for a specific DRG. The actual state norm for each DRG is the point at which the axis intersect. Each quadrant reflects the Iameter model's value. Each character, in the diagram, represents a practitioner who has admitted 3 or more patients with a diagnosis of the specific DRG (e.g. DRG 121) in the time period noted.

Figure 2.

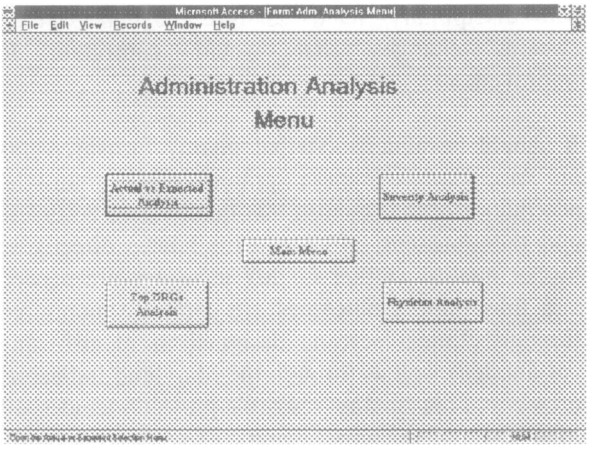


The physician level reporting displays graphically the overall severity distribution for each physician. The user may examine any physician that may have an unusual distribution of low or high severity patients. In addition, severity distributions for each DRG are graphed by either charges per patient or by LOS per patient in ascending order. With this report, the user can examine the most resource inefficient DRGs and their severity distributions. (This graph is also available by physician). The physician level reporting also provides data of all DRGs and the outcomes (charges and LOS) for an individual physician.

PATIENT level reports can be queried by DRG, by Principal Diagnosis or Primary Procedure, and by year for that patient population. Data provided with this report includes the patient's Iameter reference number, South Shore Hospital medical record number, patient age, date of discharge, severity level, sex, LOS, and charge. The same data may be exported to Lotus 123™ [12] for the development of a patient scattergram to be used for chart auditing.

The South Shore Hospital Clinical Access Program provides a comprehensive overview of South Shore Hospital patient population. The user may explore variation noted at the global level and the causes at the patient base level by "drilling down" to the information of interest. This is shown in the Administration Analysis Menu as Figure 3.

Figure 3.



The Clinical Access Program is beneficial in providing information as an educational tool to the health care team, to achieve in South Shore Hospital's mission to provide patient care in a cost-efficient, high-quality manner

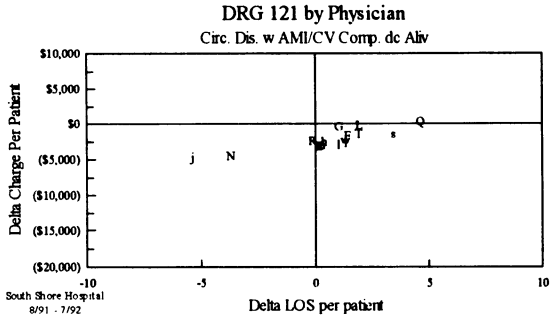
Using Iameter Data to Develop POPS

Iameter data is used to review South Shore Hospital's individual physician practice performance and compare data to the state norm. This is an important tool used to research a diagnosis or procedure that we may be interested in developing into a POP. By reviewing South Shore Hospital's practice performance data with a clinical multidisciplinary team , for example DRG 122 team members included; physicians from Internal Medicine and Cardiology, Respiratory Care, Laboratory Services, Nursing representatives from Medical-Surgical Unit, CCU, Cardiac Step-Down, Quality Assurance representatives, physician chairman of Medical Staff QA/I Committee, we were able to brainstorm/hypothesize areas in need of further review to identify any clinical, system or process issues to be addressed.

This diagram represents practice patterns prior to the review. The majority of the physicians are clustered

in the higher cost, lower LOS quadrant as shown in Figure 4.

Figure 4.



A detailed chart review and manual data abstraction was done on physician practice patterns in both the upper right quadrant (efficient) and lower left quadrant (inefficient) to isolate patterns/trends as well as any opportunities for improvement.

Initial potential opportunities for improvement were identified and were presented back to the multidisciplinary team. They included:

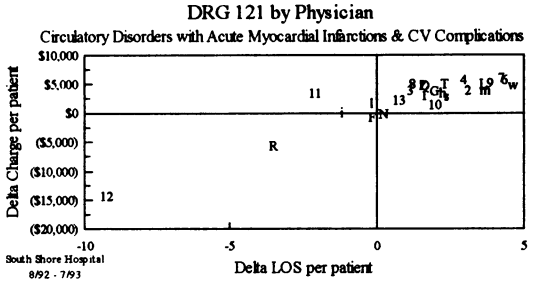
- Delays in transferring patients to other hospitals for cardiac caths
- Backlog of inpatients needing Exercise Thallium Test (ETT) slots on Mondays and Fridays
- Consider ordering non-thallium ETT prior to thallium ETT
- Move some patients awaiting inpatient ETT to the outpatient setting
- Evaluate the need to keep patients in ICU daily

The multidisciplinary focus group analyzed the data and chart review results, as well as the reasons for physician practice variations. The Medical Staff Departments were all given a presentation of the data to identify any clinical issues and address system and process concerns. A detailed plan of action was implemented to work on correcting system and process issues. The Medical Staff was made aware of their practice and ordering patterns. Physicians were all given their individual practice pattern packets which compared them to their peers and the state norm. Many changes were instituted during the following year to achieve the following performance improvement accomplishments (not all inclusive).

- Patients transferred out for cardiac caths within an average of 1.53 days
- Monday and Friday ETT slots added
- Non-thallium preceding thallium stress testing as the routine
- Increased use of outpatient ETT
- Re-evaluation on daily basis of need to keep patients in ICU

Significant improvement in practice variation was accomplished with the implementation of the process improvement opportunities identified by the team. Figure 5 indicates the migration of the physicians to the upper right quadrant.

Figure 5.



The Clinical Access Program has been used over the past several months for nearly every POP under development. The CAP data has provided our POP teams with the information needed to begin the task of reviewing how care is delivered to our patients. CAP is a useful tool to assess our past and current practice performance and to assist in setting up the POP template.

We use the Iameter system and POPS together to provide high quality patient care in a cost effective, timely manner. This enables us to continuously review our performance for sustained accomplishments as well as identify future potential opportunities for improvement.

Patient Management Redesign Committee

To monitor our information system development, the Patient Management Redesign Committee recommends changes in the information systems that will increase physician and other caregivers productivity. The view of clinical data is customized to enhance the delivery of patient care. The committee develops variance analysis reports, which identify clinical variances against the POPS. Standards are then tailored to meet specific patient outcomes. With the use of these computerized information systems, South Shore Hospital has been

able to demonstrate Quality Value outcomes to the community, employer and payer of health care.

Ongoing Monitoring and Evaluation

South Shore Hospital has redesigned its monthly standing Utilization Review Committee to expand its responsibilities to include the review, monitoring and evaluation of POPS. This committee is multidisciplinary and has medical staff members from many different disciplines. This committee has been given the authority to charge teams to develop POPS. The development of POPS are clearly driven by the desire to make processes smoother and more organized throughout the health care continuum. Variances are identified, leading to opportunities to improve clinical process and system issues. Through the reorganization of South Shore Hospital's Utilization Review Committee we will continuously monitor POPS review progress and identify any areas in need of refinement.

CONCLUSION

Use of multidisciplinary focus groups for completing chart reviews provides an acceptable method for the development of POPs and foci for practice improvement. These groups are most efficient when they are able to access patient charts representing cost effective care delivery as categorized by a shortened length of stay and efficient use of resources.

In an effort to achieve our mission South Shore Hospital has used information technology to strategically reposition our delivery of patient care. Computerized information systems have enabled South Shore Hospital to measure our performance as we continue to provide services across the health care continuum.

SUMMARY

The severity adjusted Iameter system allows comparisons of physician practice patterns using age, sex and co-morbid conditions to equate patients. Comparisons are further refined using L.O.S. and resource utilization as criteria. Using data supplied by Iameter, we have developed a system which assists us in developing POPs based on our "best practice" patterns.

To investigate the reliability and validity of this model, recommendations for further study include the following: 1) utility, as confirmed by independent investigators; 2) efficacy in terms of measured care improvement under ideal "laboratory conditions"; 3) cost-effectiveness under usual hospital conditions; and 4) generalizability to other health conditions (or DRGs) or care providers (e.g. primary care providers) and care sites.

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